ATTACHMENT F

CLOSURE PLAN

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
COPC	contaminants of potential concern
CSU	container storage unit
D&D	Decontamination and Development
DOE	U.S. Department of Energy
ft	feet/foot
HSR-1	Health Physics Operations Group
HAR-5	Industrial Hygiene and Safety Group
LANL	Los Alamos National Laboratory
NMED	New Mexico Environment Department
OLASO	Office of Los Alamos Site Operation
PPE	Personal Protective Equipment
QA/QC	quality assurance/quality control
R&D	research and development
RCRA	Resource Conservation and Recovery Act
SAP	sampling and analysis plan
SW-846	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods
SWRC	Solid Waste Regulatory Compliance
TA	technical area

ATTACHMENT F
CLOSURE PLAN

The information provided in this closure plan is submitted to address the applicable closure requirements specified in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart IX, 270.14(b)(13), and 20.4.1 NMAC, Subpart V, Part 264, Subpart G [6-14-00], which is inclusive of 264.178. This closure plan describes the activities necessary to clean close the container storage units (CSU) located at Los Alamos National Laboratory (LANL) Technical Area (TA) 50. Closure activities will minimize the need for further maintenance, preclude the release of hazardous constituents to environmental media, and be protective of human health, in accordance with the closure performance standards specified in 20.4.1 NMAC, Subpart 264.111 [6-14-00].

The CSUs addressed in this closure plan include the TA-50, Building 69 (TA-50-69), Indoor CSU and the TA-50-69, Outdoor CSU. The CSUs provide storage for hazardous and mixed wastes and are shown on Figure F-1.

Until closure is complete and has been certified in accordance with 20.4.1 NMAC, Subpart V, 264.115 [6-14-00], as discussed in Section F.1.6, a copy of the approved closure plan and any approved revisions will be on file at LANL's Solid Waste Regulatory Compliance (SWRC) and at the U. S. Department of Energy (DOE) Office of Los Alamos Site Operation (OLASO).

F.1 GENERAL CLOSURE INFORMATION

This section is prepared in accordance with the requirements of 20.4.1 NMAC, Subpart IX, 270.14(b)(13), and 20.4.1 NMAC, Subpart V, Part 264, Subpart G, which is inclusive of 20.4.1 NMAC, Subpart 264.178.

F.1.1 Closure Performance Standard [20.4.1 NMAC, Subpart V, 264.111]

The CSUs addressed in this closure plan will be closed in a manner that:

- Minimizes the need for further maintenance,
- Controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, or surface waters, or to the atmosphere, and
- Complies with the closure requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart G [6-14-00], including, but not limited to the requirements of 20.4.1 NMAC, Subpart V,

264.178, 264.197, 264.228, 264.258, 264.280, 264.310, 264.351, 264.601 through 264.603, and 264.1102.

This will be accomplished by removal of waste from each TA-50 CSU and decontamination, if necessary, of all surfaces and equipment that may have come into contact with wastes. The surfaces and equipment will either be sampled and determined to be below applicable standards or will be removed or decontaminated to meet the applicable standards which are inclusive of the closure performance standard; 20.4.1 NMAC, Subpart V, Part 264, Subpart G; and 20.4.1 NMAC, Subpart V, 264.178. All waste may be either subsequently reclaimed, recycled, or disposed of as appropriate after closure activities are completed. Decontamination activities will ensure the removal of hazardous waste residues from the TA-50 CSUs to establish cleanup levels.

F.1.2 Partial and Final Closure Activities [20.1.4 NMAC, Subpart V, 264.112 (b) and (d)]

This closure plan has been written for partial closure rather than final closure of the entire LANL facility. Partial closure will consist of closing one or more of the CSUs at TA-50 while leaving the other regulated hazardous/mixed waste units at LANL in service. Partial closure (hereinafter referred to as closure) will be deemed complete when clean closure of a unit has been verified; all surfaces and/or equipment have been decontaminated, if necessary; and closure certification has been submitted to and approved by the New Mexico Environment Department (NMED). Final closure will occur when LANL's remaining regulated hazardous/mixed waste management units are closed. Final closure will consist of assembling documentation on the closure status of each unit, including all previous partial clean closures as well as land-based units that have been or are being addressed via alternative closure requirements. Final closure will be deemed complete when the closure certification has been submitted to the NMED and the NMED has approved the final closure.

F.1.3 General Closure Schedule [20.1.4 NMAC, Subpart V, 264.112 (b)(6), 264.112(e) and 264.113]

Written notification will be provided to the NMED 45 days before the start of closure activities at any TA-50 CSU. However, pursuant to 20.4.1 NMAC, Subpart V, 264.112(e) [6-14-00], removing hazardous wastes and decontaminating or dismantling equipment in accordance with an approved closure plan may be conducted at any time before or after notification of closure. Closure activities will begin according to the requirements of 20.4.1 NMAC, Subpart V, 264.112(d)(2) [6-14-00]. Treatment, removal, or disposal of any hazardous waste will begin prior to the initiation of removal and/or decontamination of equipment and facilities in accordance with the approved closure plan, as required by 20.4.1 NMAC, Subpart V, 264.113(a) [6-14-00], within 90 days after final receipt of waste at the TA-50 CSU to be closed. This timeframe will be met as long as facilities are available for storage, treatment, or disposal of these wastes. In the event that closure activities cannot begin within 90 days,

LANL will notify the Secretary of the NMED in accordance with the extension requirements in 20.4.1 NMAC, Subpart V, 264.113(a) [6-14-00]. Closure activities and reporting requirements will then be completed within 180 days of the receipt of the final volume of waste at the CSU to be closed. Closure will be conducted in accordance with the schedule presented in Table F-1 of this closure plan. In the event that closure is prevented from proceeding according to schedule, LANL will notify the Secretary of the NMED in accordance with extension request requirements in 20.4.1 NMAC, Subpart V, 264.113(b) [6-14-00]. In addition, the demonstrations in 20.4.1 NMAC, Subpart V, 264.113(a)(1) and (b)(1) [6-14-00], will be made in accordance with 20.4.1 NMAC, Subpart V, 264.113(c) [6-14-00].

F.1.4 Amendment of the Closure Plan [20.4.1 NMAC, Subpart V, 264.112(c)]

In accordance with 20.4.1 NMAC, Subpart V, 264.112(c) [6-14-00], LANL will submit a written notification of request for a permit modification to authorize a change in the approved closure plan whenever:

- There are changes in operating plans or facility design that affect the closure plan.
- There is a change in the expected year of closure.
- Unexpected events occur during closure that require modification of the approved closure plan.

The written notification or request will include a copy of the amended closure plan for approval by the NMED.

LANL will submit a written request for a permit modification with a copy of the amended closure plan at least 60 days prior to the proposed change in unit design or operation or no later than 60 days after an occurrence of an unexpected event that affects the closure plan. If the unexpected event occurs during closure, the permit modification will be requested within 30 days of the occurrence. The Secretary of the NMED may request a modification of the closure plan under the conditions presented in the bulleted items above. LANL will submit the modified plan in accordance with the request within 60 days of notification, or within 30 days of notification if a change in facility condition occurs during the closure process.

F.1.5 Closure Cost Estimate, Financial Assurance, and Liability Requirements [20.1.4 NMAC, Subpart V, 264.140(c)]

In accordance with 20.4.1 NMAC, Subpart V, 264.140(c) [6-14-00], LANL, as a federal facility, is exempt from the requirements of 20.4.1 NMAC, Subpart V, Subpart H [6-14-00], to provide a cost estimate, financial assurance mechanisms, and liability insurance for closure actions.

F.1.6 Closure Certification [20.1.4 NMAC, Subpart V, 264.115]

Within 60 days after completion of closure activities at any TA-50 CSU or final closure of the facility, LANL will submit to the Secretary of the NMED, via certified mail, a certification that the unit has been closed in accordance with the approved closure plan. The certification will be signed by the appropriate DOE and LANL officials and by an independent, registered professional engineer, in accordance with 20.4.1 NMAC, Subpart V, 264.115 [6-14-00]. Documentation supporting the independent, registered engineer's certification will be furnished to the Secretary of the NMED upon request, as specified in 20.4.1 NMAC, Subpart V, 264.115 [6-14-00]. A copy of the certification and supporting documentation will be maintained by both DOE/OLASO and SWRC.

F.1.7 Security

Because of the ongoing nature of operations at LANL, site security at the TA-50 CSUs will be maintained by the DOE or another authorized federal agency for as long as necessary to prohibit public access. The security fence at TA-50 will be maintained to ensure that public access is prevented.

F.1.8 Closure Reports

Upon completion of the closure activities at a TA-50 CSU, a closure report will be prepared and, upon request, provided to the Secretary of the NMED. The report will document the closure and contain, for example, the following:

- A copy of the certification described in Section F.1.6 of this closure plan
- Any significant variance from the approved activities and the reason for the variance
- A summary of all sampling results, showing:
  - Sample identification
  - Sampling location
  - Datum reported
  - Detection limit for each datum
  - A measure of analytical precision (e.g., uncertainty, range, variance)
  - Identification of analytical procedure
  - Identification of analytical laboratory
- A quality assurance (QA)/quality control (QC) statement on analytical data validation and decontamination verification
- The location of the file of supporting documentation, including:
  - Field logbooks
  - Laboratory sample analysis reports

- QA/QC documentation
- Chain-of-custody forms

- Storage or disposal location of regulated hazardous/mixed waste resulting from closure activities
- A certification of accuracy of the report.

F.2 DESCRIPTION OF THE TA-50 CSUs

F.2.1 TA-50-69, Indoor CSU

The TA-50-69, Indoor CSU consists of Rooms 102 and 103. Room 102, the main process room, measures approximately 45 feet (ft) wide and 52-ft long. The long dimension is oriented northwest-southwest. Room 103, the unloading area, measures approximately 18-ft wide and 19-ft long and is located adjacent to and southeast of Room 102. A 12-ft by 20-ft roll-up vehicle access door is located at the southernmost end of Room 103, separating the unloading area (Room 103) from the vehicle airlock entrance (Room 104).

F.2.2 TA-50-69, Outdoor CSU

The TA-50-69, Outdoor CSU is located in the southwest corner of TA-50 and consists of an asphalt and concrete pad that is not lined or coated, and measures 24-ft wide and 90-ft long, with an additional strip 12-ft wide and 90-ft long added to the southwest end. The asphalt and concrete pad is approximately 4-in. thick. The long dimension of this CSU is oriented east-southeast. The pad slopes gently (approximately 1 to 5 percent) from west to east and up to 2.5 percent toward the centerline. Transportainers and other weather protective structures within the TA-50-69, Outdoor CSU provide optional weather protection for containers of various sizes. Painted lines are used to visually delineate the CSU boundary.

F.2.3 Estimate of Maximum Waste In Storage

The maximum total inventory of waste that may be in storage at any time in the TA-50 CSUs is estimated as follows:

- TA-50-69, Indoor CSU – 1,500 gallons
- TA-50-69, Outdoor CSU – 30,000 gallons

F.2.4 Description of Waste in Storage

The TA-50 CSUs are used to store containers of solid hazardous and mixed waste. The hazardous waste is generated during research and development (R&D) activities, processing and recovery

operations, decontamination and decommissioning (D&D) projects, and environmental remediation/restoration activities conducted at various TAs throughout LANL. A waste is considered hazardous if it meets the definition of a solid waste described in 20.34.1 NMAC, Subpart II, 261.2 [6-14-00]; is not exempt from regulation as a hazardous waste under 20.4.1 NMAC, Subpart II, 261.2 [6-14-00]; and exhibits any of the characteristics of hazardous waste identified in 20.4.1 NMAC, Subpart II, Subpart C, or is listed in 20.4.1 NMAC, Subpart II, Subpart D [6-14-00]. Mixed wastes currently stored at TA-50 are generated during R&D activities, processing and recovery operations, D&D projects, and general facility operations. The mixed wastes are classified as such because Resource Conservation and Recovery Act (RCRA)-characteristic or -listed wastes are or may be present, along with radioactive components. Information on the hazardous components of all waste stored at the TA-50 CSUs is provided in the "Los Alamos National Laboratory General Part A Permit Application, " Revision 0.0 (LANL, 1998a) and Attachment H of this permit renewal application.

F.2.5 Removal of Waste

Prior to initiation of closure activities, all wastes will be removed from the CSU to undergo closure. Containers may be removed from each location with forklifts. Small containers may be handled manually or with dollies. Containers will be placed onto flatbed trucks or trailers for transport. Appropriate shipping papers will accompany the wastes during transport. Containers holding hazardous or mixed wastes will be moved to an approved on-site storage unit or permitted off-site treatment, storage, or disposal facility.

F.3 CLOSURE PROCEDURES [20.4.1 NMAC, Subpart V, 264.112]

To the extent possible, all contaminated surfaces and equipment (if present) at the TA-50 CSUs will be removed and decontaminated to meet applicable standards determined at the time of closure. Surfaces and equipment that cannot be decontaminated will be containerized and managed in compliance with applicable regulations. All waste may be subsequently reclaimed, recycled, or disposed of as appropriate after closure activities are completed. Decontamination of the CSU surfaces and/or equipment will undergo verification via sampling and analysis. All sampling conducted during closure activities will be done as generally discussed in this closure plan and as outlined in the CSU-specific sampling and analysis plan (SAP) (see Section F.4) to be provided at the time of closure. Sampling and analysis will be done in accordance with appropriate QA/QC procedures as required by the individual analytical technique or the authority for the relevant standard methods. Closure will be conducted in accordance with the general schedule presented in Table F-1, as amended by the TA-50 CSU-specific SAP to be submitted prior to the actual closure.

F.3.1 Preliminary Closure Activities

F.3.1.1 Safety Precautions

Job hazards associated with closure activities will be identified, controls developed, and workers briefed before closure activities are conducted, in accordance with LANL safety procedures. Personnel involved in closure activities will wear appropriate personal protective equipment (PPE), specified by the Health Physics Operations Group (HSR-1) and Industrial Hygiene and Safety Group (HSR-5), and will follow good hygiene practices to protect themselves from exposure to hazardous and/or mixed waste. The level of PPE that will be required will depend upon the levels of radiological and/or chemical contamination that are detected, if any. If HSR-1 and HSR-5 surveys do not indicate detectable contamination levels, minimum PPE requirements will consist of coveralls, steel-toed shoes, and safety glasses or face shields. If an overhead danger is present, a hard hat will be worn. All workers involved in closure activities will be required to have appropriate training as described in Appendix D of the "Los Alamos National Laboratory General Part B Permit Application" hereinafter referred to as the LANL General Part B (LANL, 1998b). Contaminated PPE will either be decontaminated or managed in compliance with appropriate waste management regulations.

F.3.2. Background Determination

Before any decontamination activity begins, background levels for potential hazardous waste constituents will be determined. Decontamination and verification sampling procedures may involve wash water sampling, swipe sampling, soil sampling, or other methods developed by the time of closure. A minimum of two background samples will be obtained from clean water, cleaning equipment, and detergent solutions, as they are applicable to the closure. Background samples will be obtained for the material to be decontaminated and/or for any sampling materials used in swipe sampling analysis used to verify closure. Appropriate background soil sample concentrations derived from soil studies developed under the LANL corrective action or other programs will be used to determine soil hazardous constituent background levels, if applicable. Details of appropriate background levels and/or necessary samples and collection techniques will be included in the TA-50 CSU-specific SAP as discussed in Section F.4 of this closure plan.

F.3.2.1 Structural Assessment

Before decontamination activities begin, the base or secondary containment of each CSU will be inspected for any cracks or conditions that could potentially lead to loss of wash water containment. Preventive maintenance inspections are conducted routinely (i.e., weekly) at each CSU. If any defects, deterioration, damage, or hazards affecting containment have developed after the most recent preventive maintenance inspection was conducted, appropriate remedial actions (including sampling, repairs, maintenance, or replacement) will be completed before decontamination activities begin. The

base surface will be evaluated for cracks/gaps that could potentially lead to a loss of decontamination wash water. If a crack or gap is present, a swipe sample or a representative sample of the media will be taken (e.g., asphalt or concrete) to determine the presence of contamination. The sample will be analyzed for hazardous contaminants of potential concern (COPC) determined through review of the chemical properties of the waste stored during the operating history of the CSU. If contamination is detected, the surface flaw will be decontaminated prior to repairing the crack/gap. Complete or partial removal (e.g., scabbling) of the material may be performed until contamination is no longer detected. If partial removal is successful in eliminating the contamination, it will be assumed that the remaining material, including underlying soil, is clean.

F.3.3 TA-50-69, Indoor CSU

Prior to decontamination of the main surfaces at the TA-50-69, Indoor CSU, any portable equipment (if present) to be removed from the area will be wiped down with a wash water solution for decontamination. The equipment may include items such as pallets and miscellaneous waste management equipment (i.e., drum dolly, glovebox). The CSU walls and floors will then be wiped down with mops, cloths, and/or other absorbent materials to remove hazardous constituents. This will minimize the amount of liquid waste generated as a result of decontamination activities. A portable berm will be used to collect excess wash water and provide containment, as necessary during the decontamination process. The used wash water will be allowed to accumulate within the portable berm area and will then be transferred to a container where it will be sampled to determine an appropriate location for disposal.

There are no recessed areas (i.e., sumps) located at the TA-50-69, Indoor CSU. There are, however, two drains connected directly to the piping that feeds to the Radioactive Liquid Waste Treatment Facility. These drains are located in Rooms 102 and 103 and will be covered prior to the commencement of decontamination activities.

When decontamination of the CSU is complete, verification will be conducted as indicated in Section F.4. If analysis from the verification indicate that hazardous constituents are present, the decontamination and verification will be repeated until the surface or equipment (if present) has been decontaminated or the decision is made to manage it as contaminated waste. Upon determination that it is contaminated waste, the surface, or equipment may be removed, transported, and stored at other hazardous waste CSUs to facilitate the closure process.

F.3.4 Decontamination of the TA-50-69, Outdoor CSU

Closure activities at the TA-50-69, Outdoor CSU will include:

- Decontamination, recycling, and/or disposal of transportainers and/or portable equipment.
- Decontamination or removal of portions of the storage pad underlying this CSU (as indicated by the operating record).
- Sampling of surrounding soils to determine presence and/or extent of contamination (as indicated in the operating record).
- Disposal of soils and/or waste materials generated during decontamination.

F.3.4.1 Pallet Decontamination

Pallets and other portable equipment used at the TA-50-69, Outdoor CSU will be removed or decontaminated to meet applicable standards at the time of closure. Pallets and equipment that cannot be decontaminated will be containerized and managed in compliance with applicable regulations. All waste may be subsequently reclaimed, recycled, or disposed of as appropriate after closure activities are completed. If decontaminated, the pallets and other portable equipment will be wiped down with a wash water solution. This will minimize the amount of liquid waste generated as a result of decontamination activities. A portable berm will be used to collect excess wash water and provide containment, as necessary during the decontamination process. The used wash water will be allowed to accumulate within the portable berm area and will then be transferred to a container where it will be sampled to determine an appropriate location for disposal.

After the decontamination is completed, several discrete verification samples will be taken as discussed in Section F.4. If this verification sampling and analysis indicates that hazardous constituents are present, the decontamination and verification will be repeated until the pallet or equipment (if present) has been decontaminated or the decision is made to manage it as contaminated waste. Upon determination that it is contaminated waste, the pallet or equipment may be removed, transported, and stored at other hazardous waste CSUs to facilitate the closure process.

F.3.4.2 Transportainer Decontamination

Normal operations at the TA-50-69, Outdoor CSU will not expose outer surfaces of transportainers to waste contamination. Therefore, unless there is evidence of accidental outer surface contamination by spillage of regulated wastes either on the outside, or leakage from interior spills, the outer surfaces will not be sampled for contamination. If outer surfaces of a transportainer(s) are found to be contaminated with hazardous constituents, those surfaces will be decontaminated following the procedures described for transportainer interior surfaces.

If necessary, the inside of the transportainers will be pressure washed or wiped down and rinsed with wash water. A portable berm will be used to collect excess wash water and provide containment, as necessary during the decontamination process. The used wash water will be allowed to accumulate within the portable berm area and will then be transferred to a container where it will be sampled to determine an appropriate disposal path.

After the decontamination is completed, several discrete verification samples will be taken as discussed in Section F.4. If this verification sampling and analysis indicates that hazardous constituents are present, the decontamination and verification will be repeated until the transportainer has been decontaminated or the decision is made to manage it as contaminated waste. Upon determination that it is contaminated waste, the transportainer may be removed, transported, and stored at other hazardous waste CSUs to facilitate the closure process.

F.3.4.3 Storage Pad Decontamination

Operational records (e.g., inspection findings, occurrence reports), visual inspection, and analytical data (if necessary) will be used to determine if the asphaltic concrete pad at the TA-50-69, Outdoor CSU is contaminated by hazardous constituents from waste management operations at the unit. Those areas suspected of being contaminated will either be removed from the pad, or washed with a wash water solution. Removal, containerization, and disposal of contaminated asphalt is likely to be the option of choice.

A portable berm will be used to collect excess wash water and provide containment, as necessary during the decontamination process. The used wash water will be allowed to accumulate within the portable berm area and will then be transferred to a container where it will be sampled to determine an appropriate location for disposal.

After the decontamination is completed, several discrete verification samples will be taken as discussed in Section F.4. If this verification sampling and analysis indicates that hazardous constituents are present, the decontamination and verification will be repeated until the pad has been decontaminated or the decision is made to manage it appropriately as contaminated waste.

Used washwater samples may exhibit anomalously high levels of organic compounds due to leaching of the asphalt during washdown. If this is the case, record reviews (e.g. manufacturer's specifications, Material Safety Data Sheets) and additional analyses may be performed to determine if leaching of organics from the asphalt contributed to the organic compound concentration in the used washwater. If this additional evaluation confirms the asphalt as the source of contamination, baseline concentrations

for clean washwater will be adjusted accordingly. If decontamination verification cannot be demonstrated, the container storage pad may be evaluated using an alternative demonstration of decontamination. If all alternative demonstrations fail, the container storage pad will be removed.

Record reviews and visual inspection of soils along the margins of the TA-50-69, Outdoor CSU will be used to identify areas where soil contamination from waste management activities could have occurred. Soil sampling will be conducted in any suspected contaminated areas and in those areas where the asphalted concrete pad has been removed due to contamination with hazardous constituents. Before closure activities begin, soil samples will be collected from appropriate areas and analyzed to serve as background samples. A statistically representative number of soil samples will be collected from contaminated area(s) to a 6-inch (in.) depth. Samples will be equally spaced to ensure representative sampling of the contaminated area(s). If contamination resulting from container storage activities is discovered, the contaminated soils will be either remediated in place, or removed for proper disposal.

F.3.4.4 Soil Sampling and Decontamination

Soil removal at the TA-50-69, Outdoor CSU may be conducted to meet the closure performance standards. Examples include the detection of contamination that has migrated beyond the asphalt pads to the surrounding soil, and cases in which operating records indicate that a release of hazardous waste from storage structures to the surrounding soil has occurred. If records indicate that no release of hazardous waste to soils has occurred, soil sampling will not be conducted.

If collection of soil samples is necessary to demonstrate decontamination, background soil samples will be collected and analyzed for the COPCs identified in the operating record to provide a baseline for decontamination verification. Sampling locations to determine the extent of contamination will be based upon a biased random sampling approach, including historical evidence of releases, or visual staining, and any other information that indicates a potential contamination pathway. The number of samples, locations, depths, and sampling methods will be determined before closure and included in the TA-50 CSU-specific closure SAP, as discussed in Section F.4. Results from sampling will be compared to the background samples and/or baseline concentration levels included in the closure SAP. If analysis shows that the soil at the storage area is contaminated, soil sampling results that are above the background/baseline levels will be used to identify the extent of soil contamination. Contaminated soils will be removed in layers and sampling conducted following removal of each layer. This procedure will be used to minimize the amount of soil removed.

F.3.5 Decontamination Equipment

Prior to use, all reusable sampling equipment used during decontamination in closure activities will be

cleaned and rinsed, as described in the closure SAP. Sampling equipment rinsate blanks will be collected and analyzed in accordance with the QA/QC procedures described in the closure SAP. Reusable decontamination equipment, including protective clothing and tools, used during closure activities will be scraped as necessary to remove any residue and cleaned with a wash water solution (the closure SAP will include a discussion of wash water solutions). Residue and disposable decontamination equipment as well as reusable decontamination equipment that cannot be decontaminated will be containerized and managed appropriately at an approved on-site facility, depending on the regulated constituents present.

F.4 DECONTAMINATION VERIFICATION

Sufficient sampling and analysis will be conducted to demonstrate that hazardous waste residue is not present at the CSU after closure. Wash water sampling, swipe sampling, or other appropriate sampling and analysis methodologies may be used to verify decontamination. The verification sampling method will be determined at the time of development of the TA-50 CSU-specific closure SAP and will be based on factors such as COPCs and materials of construction for the storage structure. The SAP will establish the minimum number of verification samples based on the total surface area of the CSU. Using a biased random sampling approach, items, structures, and/or surfaces will be sampled for verification of decontamination. Sample bias will include known or likely areas of contamination, low areas, sumps, and known spill locations, as determined to be appropriate on a case-by-case basis.

For wash water-based decontamination verifications, samples of clean wash water solution squeezed from mops, sponges, and/or other absorbent materials prior to use will be collected for a baseline comparison. The samples will be analyzed for the COPCs, as presented in the TA-50 CSU specific SAP. Analytical procedures will conform to methods found in the most current version of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (*SW-846*) (U.S. Environmental Protection Agency, 1986).

Used wash down solutions will be analyzed for the same parameters. Wash down solutions will be considered contaminated if the used wash water solution shows a significant increase (i.e., determined using statistical methods defined in *SW-846*) in the analytical parameters over the clean wash water solution. If additional decontamination is deemed necessary, the verification procedure will be repeated.

Swipe sampling may be used on a case-by-case basis to determine verification of decontamination at the TA-50 CSUs. Background for swipe samples will be determined by submitting an unused swipe and

solvent sample for analysis of the CSU COPCs. Swipe samples will be analyzed using approved methods, which will be included in the closure SAP.

If other sampling methodologies have been developed at the time of closure for the TA-50 CSU, their use to determine decontamination will be addressed in the closure SAP.

For any sampling methodology, decontamination will be verified if the collected samples meet any of the decontamination criteria listed in Section F.3.6 of this closure plan. If the verification sampling indicates contamination higher than the approved values, additional sampling will be performed to establish the boundaries of contamination for large structures. After establishing the boundaries of contamination, the decontamination process will be repeated within those boundaries, using portable berms or other appropriate material to limit the potential for run-off from the affected area. An additional round of verification sampling will be performed for all of the areas previously determined to be contaminated. After each decontamination event and verification iteration, a decision will be made to repeat the process or remove contaminated materials and dispose of them properly.

F.5 DECONTAMINATION VERIFICATION CRITERIA

Successful decontamination is defined as one of the following criteria:

- No detectable hazardous waste or hazardous constituents from container storage activities are found in the final sample.
- Detectable hazardous waste or hazardous constituents from container storage activities in the final sample are removed to statistically significant levels based on baseline concentrations in the clean wash water.
- Detectable hazardous waste or hazardous constituents from container storage activities in the final sample are at or below levels agreed upon with the NMED.
- Detectable hazardous waste or hazardous constituent concentrations from container storage activities do not significantly decrease after several wash downs. In such an event, hazardous constituents that pose an acceptable risk will be allowed to remain, as mutually agreed upon with the NMED.

An alternative demonstration of decontamination may be proposed and justified at the time of unit closure, as circumstances indicate. The Secretary, NMED, will evaluate the proposed alternative in accordance with the standards and guidance then in effect and, if approved, incorporate the alternative into this closure plan.

F.6 SAMPLING AND ANALYSIS PLAN [20.4.1 NMAC 264.112(b)(4)]

Sampling and analytical procedures will be performed during the decontamination and verification activities associated with the partial closure of the TA-50 CSUs covered by this plan. These

procedures will use standard approved methods (e.g., SW-846), as appropriate, for making closure decontamination verification determinations. However, the TA-50 CSUs are not anticipated to undergo closure for a relatively long time, and it is probable that sampling and analytical methods will be revised and improved before closure. In order to alleviate the need for future closure plan and permit modifications until actual closure activities are scheduled, LANL will submit TA-50 CSU-specific closure SAPs to the NMED at the time of closure notification for review and approval.

The TA-50 CSU-specific closure SAPs will contain a detailed discussion of the available CSU information and proposed clean closure methodology to assure the closure performance standards are met. These closure SAPs for the TA-50 CSUs will, at a minimum, include:

- A detailed discussion of site characteristics.
- The CSU operational history, to include descriptions of known spills, releases, and/or evidence of potential problems (e.g., visual stains).
- Chemical properties of the waste stored at the CSU.
- Determination of applicable COPCs.
- A detailed hazard control plan, including a review of chemical hazards present at the site, control and monitoring methods and procedures, and required PPE.
- Determination of wash water solution composition, if necessary.
- Detailed procedures for decontamination methods for equipment, structures, and media.
- Discussion of background levels determined through sampling or use of published data and their relevance to the specific CSU.
- Methods for sampling and analysis of contaminated media.
- Removal procedures for contaminated media, if necessary.
- Sampling methods for decontamination media and hazardous waste determination. The discussion will include the rationale for using wash water samples, swipe samples, soil samples, and/or other sampling methodology.
- Sampling methods for decontamination verification procedures. The discussion will include the statistical or judgmental basis for determining the number of verification samples needed and the constituents to be analyzed for.
- Sampling equipment decontamination and disposition procedures.
- Sample handling and documentation procedures.
- Analytical methods and the rationale for their determination.

- Disposition of removed waste, decontamination media, or contaminated soils. This discussion will identify on- or off-site hazardous waste management facilities used for final disposition and the types of wastes shipped.

- Decontamination criteria.

- Statistical basis for verification of decontamination, if applicable. The discussion will include information on determination of statistical increases in analytical parameters and numerical values for significant increases.

- Risk assessment procedures to be used, if necessary.

- Field and laboratory QA/QC procedures.

- Schedule of closure activities, including decontamination, sampling, analysis, potential removal of soils, and final report submittal.

- Identification of contact person or office.

F.7 REFERENCES

EPA, 1986 (and all approved updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

LANL, 1998a, "Los Alamos National Laboratory General Part A Permit Application," Los Alamos, New Mexico, Los Alamos National Laboratory.

LANL, 1998b, "Los Alamos National Laboratory General Part B Permit Application," Los Alamos, New Mexico, Los Alamos National Laboratory.

Table F-1
Schedule for TA-50 Closure Activities

Activity	Maximum Time Required [a]
Submit CSU-specific Closure/Sampling and Analysis Plan	-90 Days
Notify the New Mexico Environment Department (NMED)	-45 Days
Collect background samples (if applicable)	-5 Days
Final receipt of waste	Day 0
Begin closure activities (i.e., removal of wastes)	Day 5
Decontaminate surfaces and/or equipment	Day 10
Perform verification sampling of the surfaces and/or equipment	Day 20
Evaluate analytical data	Day 50
Perform additional decontamination (if necessary)	Day 55
Perform additional verification sampling (if necessary)	Day 60
Evaluate analytical data	Day 75
Perform asphalt decontamination and verification sampling	Day 80
Evaluate analytical data	Day 95
Perform soil sampling (if necessary)	Day 100
Evaluate analytical data	Day 120
Perform final clean up (i.e., removal of decontaminated equipment and decontamination waste)	Day 140
Verify decontamination	Day 150
Submit final report to NMED	Day 180

[a] The schedule above indicates calendar days from the beginning by which activities will be completed. Some activities may be conducted simultaneously and/or may not require the maximum time listed. Extensions to this schedule may be requested, as needed.